

CLAREMONT RAILWAY BRIDGE
Claremont Railway Company line, spanning
the Sugar River, 3.8 miles east of
Vermont State line
Claremont
Sullivan County
New Hampshire

HAER No. NH-24

HAER
NH
10-CLAR,
20-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service
Northeast Region
Philadelphia Support Office
U.S. Custom House
200 Chestnut Street
Philadelphia, P.A. 19106

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LOCATION: Claremont Railway Company line, spanning the Sugar River, 3.8 miles east of Vermont state line, Claremont, Sullivan County, New Hampshire.

USGS Mt. Ascutney, New Hampshire Quadrangle,
Universal Transverse Mercator Coordinates:
18.714990.4805710

ENGINEER/BUILDER: Engineer and truss fabricator unknown. Erected by Standard Construction, Boston, Massachusetts, for Claremont Railway and Lighting Company, Claremont, New Hampshire.

DATE OF CONSTRUCTION: 1903

PRESENT OWNER: New Hampshire Department of Transportation (NHDOT)

PRESENT USE: Abandoned railway bridge.

SIGNIFICANCE: The Claremont Railway Bridge is a representative example of a riveted steel Warren deck truss railway bridge, typical of early twentieth-century bridge technology. The bridge lies at the heart of Claremont's Lower Village National Register Historic District. The bridge was an important link in Claremont's electrified street rail service. The line moved passengers and freight between West Claremont, Claremont, and the main line of the Boston and Maine Railroad at Claremont Junction during the first half of the twentieth century.

PROJECT INFORMATION: The Claremont Railway Bridge was recorded in October 1995 by the Cultural Resource Group of Louis Berger & Associates, Inc., East Orange, New Jersey, for NHDOT. The recordation was undertaken pursuant to a Memorandum of Agreement between the Federal Highway Administration and the New Hampshire State Historic Preservation Officer, executed in association with the planned replacement of the Main Street Bridge, Claremont, New Hampshire. Project personnel included Richard M. Casella, Senior Architectural Historian, and Rob Tucher, Photographer.

DESCRIPTION

The Claremont Railway Bridge consists of a single-deck truss span resting on stone and concrete abutments. Although presently abandoned, the bridge originally carried the electrified Claremont Railway Company's freight and passenger cars in an east-west direction over the Sugar River. The bridge is located approximately 30 feet east of the intersection of Main and Elm streets, approximately 40 feet west of the intersection of Main and Union streets, and approximately 3.8 miles east of the Vermont state line.

The overall dimensions of the bridge, which spans the river at a height of about 15 feet, are approximately 110 feet long, 10 feet wide, and 10 feet deep. The deck truss is of the Warren type, characterized by parallel chords and diagonal members which function in both tension and compression. All members of the truss are of steel with riveted connections, except where welded repairs have been made. The bottom chords, diagonals, and verticals are riveted I-section members consisting of angle flanges and lacing-bar webs. The top chords consist of double channels approximately 12 inches deep, connected with cover plate and double lacing bars. Intermediate bracing is placed at each vertical and consists of two 4-inch angles. Extensive welded repairs have been made to many of the structural members, including the infilling of beam webs with solid plate, and the addition of sections of angle, plate, and bar stock to reinforce various members. The railroad ties rest directly on the top chord, spaced 18 inches between centers. A single set of rails remains on the bridge, disconnected at each end. A 24-foot section of diagonal lattice wrought-iron railing, which was salvaged and reused from an earlier highway bridge at the site, remains in place on the north side and east end of the bridge. The other railing on the north side consists of woven wire fence attached to two rows of 2-inch steel pipe. The south side is protected by the pipe railing of the adjacent highway bridge. Both ends of the bridge tightly meet the rubble stone retaining walls which edge the river. The bottom chords at the west end of the bridge are fixed, imbedded in the stone retaining wall, and mortared in place. The east end of the bridge rests on friction bearings, which in turn sit on a concrete abutment cast against the stone retaining wall.

HISTORICAL INFORMATION

Background

The Claremont Railway Bridge is located on the west side of Claremont, in the neighborhood known as Lower Village. This section of Claremont was largely the product of two major phases of industrial development, the first beginning in 1832, and the second initiated some 50 years later. The first phase began with the formation of the Claremont Manufacturing Company for the express purpose of harnessing the waterpower potential of the Sugar River. The founders of the Claremont Manufacturing Company purchased 15 acres along and near the river, including four waterfalls, and immediately began development of the property, which included

the laying out of Central, Main, and River streets in the Lower Village. Initial construction included a timber dam, a stone factory for the production of satin and paper, houses, and stores. By the 1850s, enterprises in the Lower Village included the Sugar River Gristmill, still extant at the east end of the Claremont Railway Bridge, several facilities of the Claremont Manufacturing Company upriver, and downriver, a cutlery, a woolen mill, and a foundry (Candee 1977:16; Walling 1851).

Beginning in the 1880s, another industrial building boom occurred within the Lower Village that resulted in the replacement of existing manufactories and the expansion of others to meet new production requirements. Waterpower sites below Main Street came to be dominated by the Sugar River Paper Company and the Bailey hosiery mill, while the firm of Freeman and O'Neil developed extensive woodworking facilities just west of the Claremont Railway Bridge. Further upriver, the Maynard & Washburn Shoe Manufactory redeveloped many of the former Claremont Manufacturing Company sites. Between 1888 and 1919, the Sullivan Machinery Company, which had initiated production along the Sugar River in 1868, significantly expanded its operations, with massive facilities on both sides of the river. With each corporate expansion, the need for housing, commercial services, and transportation improvements correspondingly increased (Candee 1977; Hurd 1892; Sanborn Map Company 1925).

History of the Claremont Railway and Claremont Railway Bridge

By the mid-1890s, Claremont was a prosperous industrial town with an ever-growing population. Citizens began talking about the need for a street railway that would connect the populace of Claremont, West Claremont, and Claremont Junction with one another, and with the stations of the Boston and Maine Railroad located on the south side of town and in Claremont Junction. In 1899, local organizers petitioned the New Hampshire State Legislature and were granted a franchise to build and operate the Claremont Street Railway. Arranging the financing for the project took two years, and included the purchase and merger of the Claremont Electric Lighting Company. Hiram R. Beckwith was elected the first president of the new company, renamed the Claremont Railway and Lighting Company. A construction contract was awarded to the Standard Construction Company of Boston on June 4, 1902. Groundbreaking occurred in July with the construction of the power-generating plant on the north bank of the Sugar River, next to the Claremont Paper Company. A total of 5.5 miles of main line and 3 miles of spurs and sidings were laid, using 60-pound rail and oak ties spaced two feet on center.

The Claremont Railway Bridge was built in 1903 on the Main Street portion of the rail line, which ran west from Tremont Square in the center of downtown Claremont, down the hill, and into the industrial neighborhood known as the Lower Village. In the Lower Village, the line formed a four-way junction with the company's Union and River Street line. The corner of Main, Union, and River streets was a busy intersection where townspeople and factory workers often congregated. The Sugar River Mills, which included a sawmill and a gristmill, was

located on the north corner of the intersection, while Hall's general store and Thrasher's meat market were located on the south corner. Industry had centered around this point since the 1840s. The iron-arch Main Street Bridge crossed the Sugar River immediately west of the intersection, and provided a popular access point for the excitement of viewing the river during high water or floods. Judging from an 1895 photograph of the Main Street Bridge, crossing the river at this point to reach West Claremont must have presented an obstacle to the railway's plans, due to the close proximity of the buildings to the river's edge. The roadway bridge probably was considered for carrying the trolley tracks across the river, but was found incapable of carrying the load. The railroad decided to build a new steel truss bridge for the railroad tracks and insert it tightly along the north side of the existing roadway bridge (the existing Claremont Railway Bridge). In order to accomplish this, it appears that the roadway bridge was shifted slightly south on its stone abutments, perhaps four feet, to make room for the new railroad truss. In addition, the bridge's north sidewalk and hand railing were removed, along with its supporting iron work. The fancy iron railing from the road bridge was reinstalled on the railway bridge, and a short section of it remains in place today (Waite 1895:157).

On August 11, 1903, the twin 200-horsepower Trump turbines in the railway's power plant came on line and began producing the 650-volt direct current to power the railway. The company consisted of six officers and 30 employees. Startup equipment included three 45-foot Laconia combination passenger and baggage trolley cars, a freight motor car to move steam freight cars interchanged with the Boston and Maine Railroad, a construction car, and a double-truck Wason-built nose plow. Regular passenger trolley service began on August 16, 1903. Two passenger trolleys provided service every half hour between 6 a.m. and 10 p.m. at a cost of five cents, with special commuter rates for schoolchildren and mill hands. One of the trolleys was kept in reserve in the event of breakdowns (Shaw 1946:6-8).

The company reorganized in 1907, and again in 1914, when outside interests bought control. Following World War I, in September 1918, the railway announced that it was bankrupt and was suspending service entirely. Local industries which had become dependent upon the freight service banded together and purchased the assets of the firm, renaming it the Claremont Railway Company. In 1930, due to the effects of the Great Depression and the automobile, passenger service was permanently discontinued, but freight service continued throughout World War II. In 1945, the Claremont Railway was the last electric railroad operating in New Hampshire (Shaw 1946:16-17).

In 1954, the Pinsley Railroad took possession of the Boston and Maine Railroad's Concord to Claremont line, and replaced Claremont's electric freight service with diesel electric service over Claremont's lines. This service was still in operation in 1964, although the lines have since been abandoned and removed in most places (*Claremont Daily Eagle* 1964:66).

The Warren Truss

The Warren truss was designed in England by James Warren and Theobald Monzani in 1848. Their intention was to create the simplest possible truss, composed of members of equal length and dimension, allowing economy in manufacture and assembly. In its pure form, the Warren truss is composed of a series of connected equilateral triangles, with the diagonals functioning alternately in compression or tension. All loads on the truss produce a compressive stress in the top chord, a tensile stress in the bottom chord, and stresses equal in magnitude, but opposite in sign, in adjoining web members (diagonals). Although not a specific claim of the inventors, the design allowed for the easy calculation of the stresses involved and would become the standard textbook example on the subject. The practical characteristics of the truss and its attractive simplicity have made it the most widely used and modified truss form (Condit 1960:117,118; DuBois 1900:54; Ketchum 1905:65,66).

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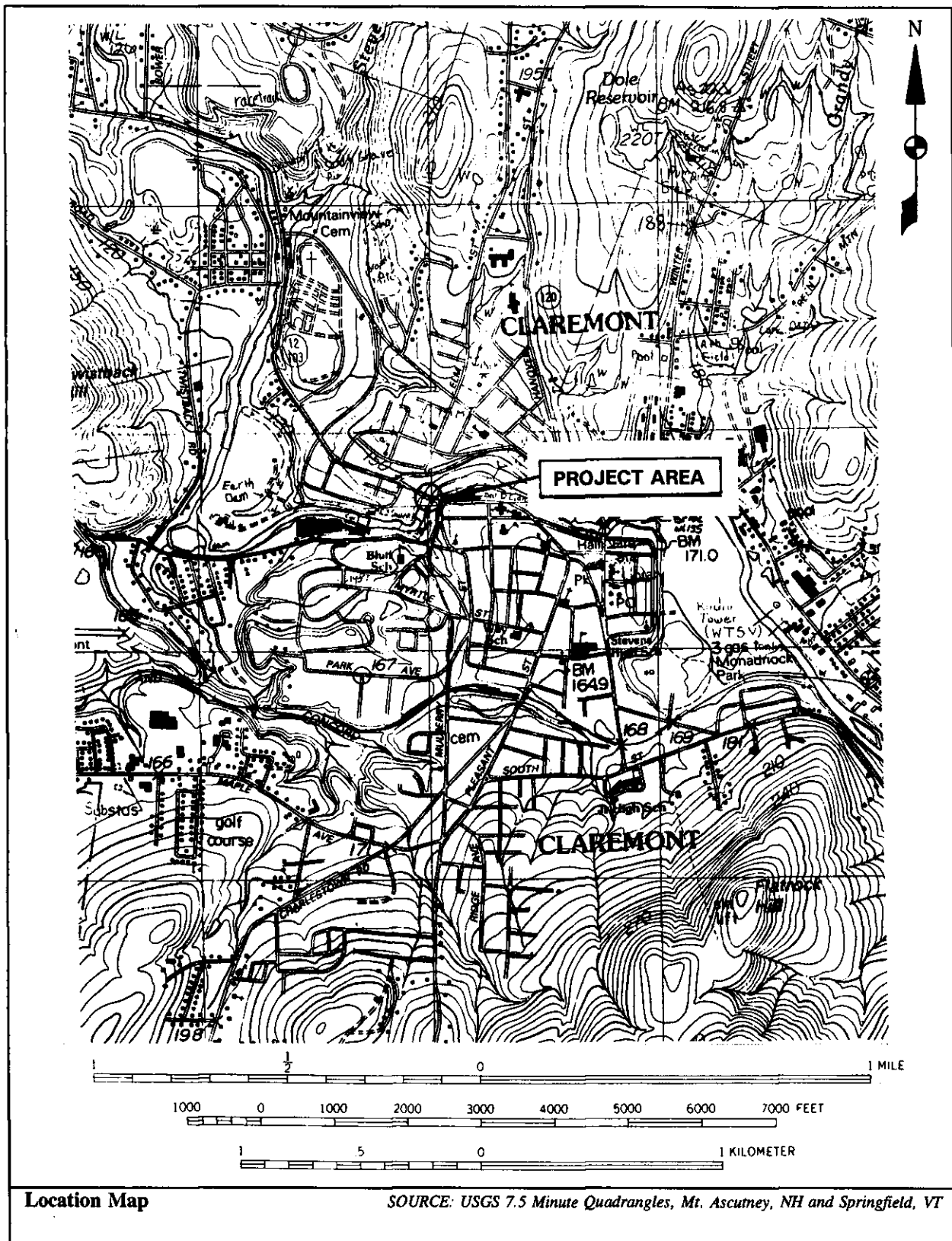
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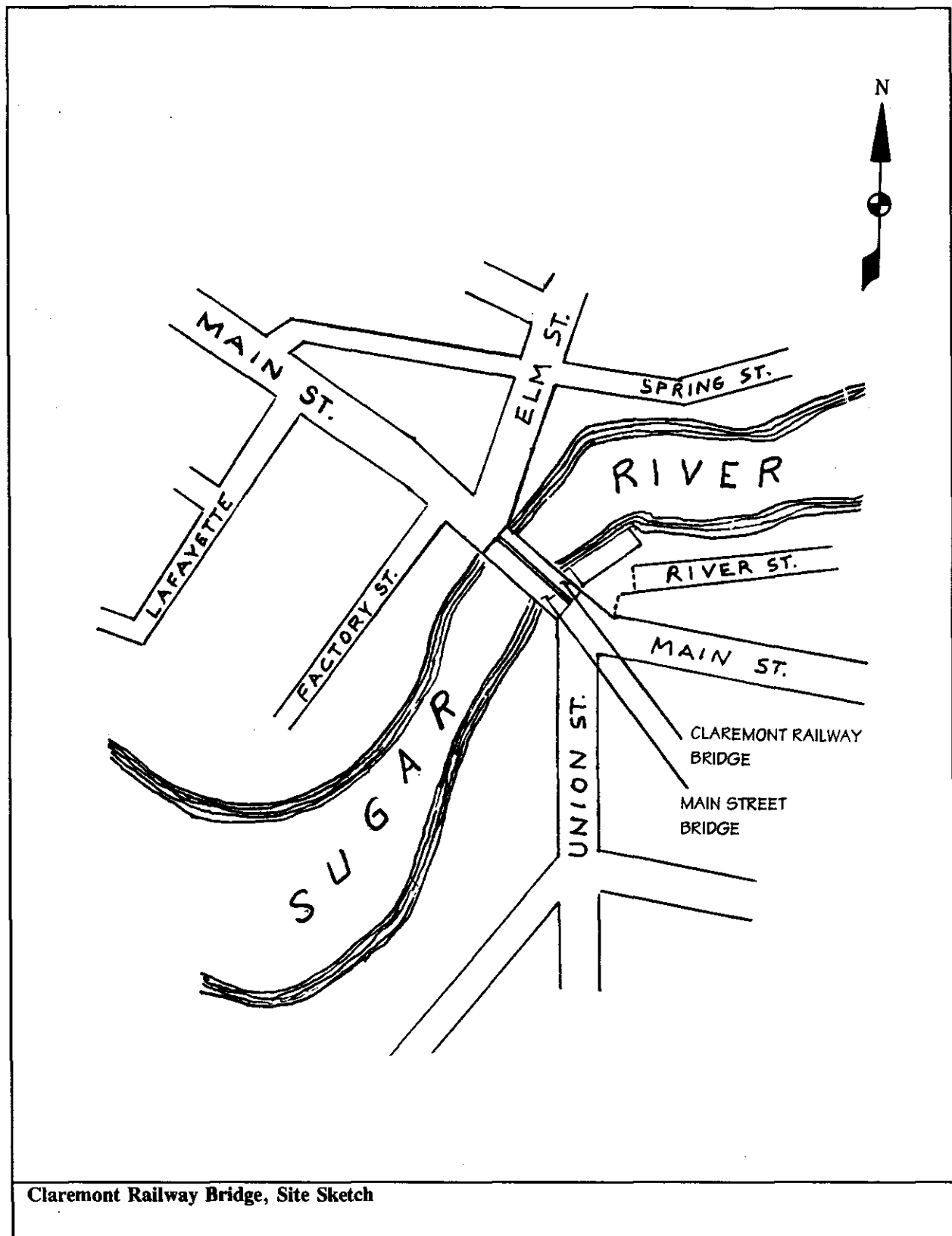
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Claremont Railway Bridge, Site Sketch